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CALIFORNIA COASTAL EUPITHECIAS

WITH DESCRIPTION OF A NEW SPECIES (*Geometridae*)

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THE COAST OF CALIFORNIA has always been an excellent collecting location due to its unique ecology. Yet after early work in the San Francisco area by Behrens and Henry Edwards, very little collecting has been done there, considering the potential rewards that are available. As a case in point, consider *Lithophane vanduzeei*. This fine Noctuid has been taken rarely, if at all, since its original description from the coastal region. Yet it was recently re-discovered in the Carmel-Monterey area, on three separate occasions, by collectors who finally ventured into this area at the proper time.

The coastal region as defined in this paper extends, in a somewhat disjoint manner, from San Diego to Inverness in Marin County. Thus included are the fine stands of pine and cypress at Inverness, Carmel, Cambria, and Oceanside. The forests of Mendocino County northward have been intentionally excluded; the insects here are, in general, quite different. Some of the species of the southern-more coast are indeed found all the way to Vancouver; yet looking in the other direction, there are many species whose southern terminus is in Mendocino County.

It would be desirable to publish a list of all Lepidoptera of the California Coast. However, this paper has been necessarily restricted to a more modest undertaking — a discussion of the Geometrid moths of the genus *Eupithecia*, from the coastal region. This particular genus reaches an amazing development here. Of the 66 species found in California, at least 27 have been found along the lower coast. Further, it was possible to capture 14 of these species in a single night of collecting at one location (with black light in the beautiful forest overlooking Monterey Bay).

Table 1: Occurrence of California Coastal Eupithecia's throughout the Year

Name	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1. Kareneae				3-Cmb 7-Crm		8-Cmb	2-Inv	4-Inv	1-Cmb	1-Crm	1-Inv	6-Crm
2. Columbista				3-Crm		1-Cmb			1-Cmb			
3. Meestosa				1-Inv		2-Cmb	3-PV		2-PV		1-Inv	
4. Sabulosata				5-Crm		16-Cmb						
5. Subvirens				1-Cmb		11-Cmb	8-Cmb		2-Cmb			2-Inv 4-Crm
6. Placidata				3-Crm	1-SB		1-PV			1-PV		
7. Macrocarpata						1-SB	3-Brk					
8. Misturata							3-Cmb		1-PV			3-Crm
9. Miserulata zela					1-PV	5-Cmb	2-PV			1-PV		
10. Bivittata			1-Inv	3-Cmb 1-Crm 1-Inv		1-Inv 4-Cmb	4-Cmb 2-Inv					
11. Albipunctata					5-Inv							
12. Rotundopuncta				26-Crm 15-Cmb 4-Inv	15-Inv	1-Cmb					1-PV	
13. Iitoris												
14. Macdunnoughi				3-Inv				1-Crm				
15. Cupressata						1-Crm						
16. Cognizata				1-Crm								
17. Annulata				2-Crm								
18. Niphadophilata(?)				4-Inv								
19. Furpurissata				15-Crm								
20. Subapicata				9-Inv								
21. Shirleyata				1-MB								
22. Graefii				1-Cmb	1-Inv	1-Cmb				2-Crm		1-Crm
				7-Crm								
				1-Inv								
23. Nevadata				1-MB								
24. Implorata				8-Crm								
25. Cestata				1-Inv								
26. Cestatoides												
27. Ravocostaliata				2-Crm								

Code:

Brk = Berkeley, Alameda Co.
 Cmb = Cambria Pines, San Luis Obispo Co.
 Crm = Carmel, Monterey Co.
 Inv = Inverness, Marin Co.
 MB = Morro Bay, San Luis Obispo Co.
 PV = Palos Verdes, Los Angeles Co.
 SB = Santa Barbara, Santa Barbara Co.

No specific records

X

Table One presents the occurrence of these species over all months of the year, from the author's experience. Note that many of these species can be taken essentially at any time of the year — *subvirens*, *sabulosata*, *graefti*, and also the new species to be described here, *karenae*. The data here is just a beginning: a few more collecting trips in the early part of the year would certainly add numerous entries.

In Table Two, the distribution pattern of those Eupithecia's found along the coast is summarized. Some species range far indeed: *maestosa* and *placidata* are found in most of the western states, while *misturata* is found across the entire continent, including its eastern race. Yet at least nine of the species are found only (so far) along the coast. This latter group of localized species includes the rarer and most prized specimens such as *karenae*, *macrocarpata*, *cupressata*, and *purpurissata*.

These brief facts must serve to set the stage for the description of a new species of *Eupithecia* whose habitat is this coastal region. A search of the literature, (including McDunnough's comprehensive monograph) and museum collections (LACM, AMNH) has not disclosed an available name for this species, and only a couple specimens, yet in the past five years it has been taken in relative abundance.

Eupithecia karenæ, n. sp.

Female: The ground color of the primaries is a rich golden or red brown. The lines are contrastingly black, shaded outwardly with white. The basal line is small, fine, evenly rounded outwardly. The AM starts at the costa at the one-third point, and in the upper half of the wing curves evenly around toward the inner margin. However, just below Cu, the AM projects sharply outward in a pointed, horizontal "tooth" which intersects the PM line. The remainder of the AM below this tooth is only faintly indicated, but is double if traceable. The PM is smoothly sinuate, being concave at the inner and outer margins and convex in the cell. It is followed by a parallel lighter band greater than its width, edged with gray. The appearance here, in many specimens, is that the PM is geminate. The ST is complete, accentuated with white near the apex and by a series of black blotches from the middle of the wing toward the inner margin. There is a sharp inward jog at the anal angle, where the black shading is most prominent (Fig. 1 A).

The secondaries are much lighter, but still well shaded with brown outwardly and along the anal margin. The PM is distinct,

Table 2: Distribution of California Coastal Eupithecia's

Name	Calif. Coast only	N.Calif. Coast, Oreg.; BC	Also found in:			Rocky Mts., Ariz.	Eastern and Canada
			Inland in Calif.	Sierra's			
1. Karenae	X						
2. Columbiata		X					X(race)
3. Maestosa		X	X	X	X		
4. Sabulosata	X						
5. Subvirens	X						
6. Placidata		X	X	X	X		
7. Macrocarpata	X						
8. Misturata		X	X	X	X		X(race)
9. Miserulata zela	X						X(race)
10. Bivittata	X						
11. Albipunctata		X					
12. Rotundopuncta		X					
13. Litoris		X					
14. Macdunnoughi			X	X	X		
15. Cupressata	X						
16. Cognizata	X						
17. Annulata		X				X	X
18. Niphadophilata		X					
19. Purpurissata	X						
20. Subapicata		X					
21. Shirleyata	X						
22. Graefii		X	X	X			
23. Nevadata		X	X	X(race)	X(race)		
24. Implorata		X					
25. Cestata			X				
26. Cestatoides			X				
27. Ravocostaliata		X					X

black, and straight. The ST is indicated by blackish shades edged outwardly with white.

The underside is whitish with a tan tinge. The most prominent marks are the PM line of both wings at the outer margin; it gradually fades out toward the inner margin. There are distinct discal marks on all wings which do not show above. The forewing has an elongate discal bar, while the hindwing has a minute dot.

Wing expanse is 19 - 22 mm.

Female genitalia: The ductus bursae enters at the apex of the extremely slender, highly striate bursa neck. The latter, in turn, is attached to the bursa just inside a striated, raised ring. The bursa is quite globular, with spining all around on the upper two-thirds. The ductus seminalis is a tube of even width, attached near the apex. The female genitalia, as a whole, appears much like an apple, complete with a long slender stem (Fig. 1 C). The appearance is closest to that of *E. subvirens*, but differs in that the latter has a much stouter neck.

Male: Identical with the female in pattern and coloration. Wing expanse is 18 - 19 mm. (one example taken in September is only 15 mm.).

Male Genitalia: The clasper is long and narrow, almost straight along the basal two-thirds of its outer edge, with a slight bulge on the inner edge (Fig. 1 B). The ventral plate of Segment VIII is highly chitinized, with excellent characters present. The general shape is that of a horse-shoe, formed from two narrow curved rods becoming hook-like in their apical third. Just before the apex there is a relatively large, rounded lobe projecting inward (somewhat like *E. palpata*), formed by a thin membrane on a stouter base (Fig. 1 D). The shape of this plate is closest to that of *E. maestosa*, yet the latter has no inward projecting lobes.

Holotype — ♀, Carmel, Monterey Co., Calif. April 4, 1960 (R. H. Leuschner) To be deposited in the Los Angeles County Museum collection.

Allotype — ♂, Carmel. Dec. 30-31, 1962 (R. H. Leuschner) In author's collection.

Paratypes — 3 ♂, 9 ♀, Carmel. April 4, 1960 (5); April 4, 1965; Oct. 22, 1963; Dec. 30-31, 1962 (5). (R. H. Leuschner)

5 ♂, 7 ♀, Cambria Pines, San Luis Obispo Co., Calif. April 4, 1964; April 3, 1965 (2);

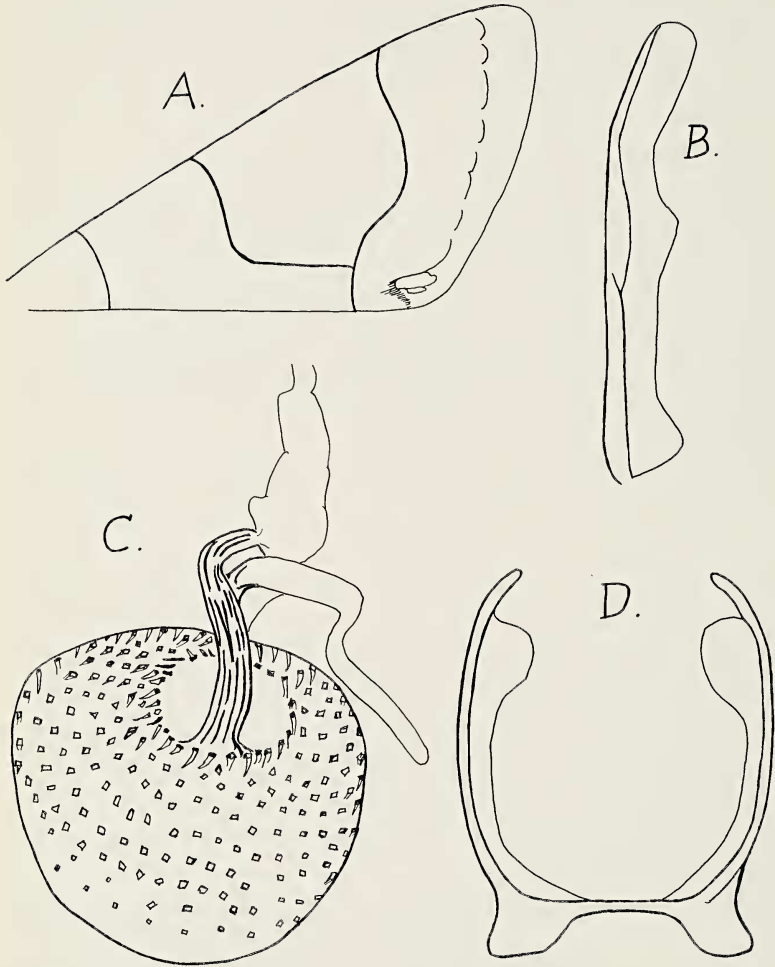


Fig. 1. *Eupithecia karenae*, n. sp. A: forewing pattern; B: left clasper of male genitalia; C: female genitalia; D: ventral plate of male sternite VIII.

June 23, 1961 (8); Sept. 11, 1961. (R. H. Leuschner)

6 ♀, Inverness, Marin Co., Calif. July 27, 28, Aug. 5, 6, 19, 27, 1962 (C. W. Kirkwood)

1 ♀, McClure Beach, Pt. Reyes Peninsula, Marin Co., Calif. Nov. 19, 1957 (W. R. Bauer, S. Buckett)

Paratypes will be deposited in the following collections and museums: Leuschner, Kirkwood, Bauer-Buckett, AMNH, CNC, and USNM.

In addition to the above series, there is a singular female specimen of this species in the California Academy of Sciences collection, ex Guedet collection. The label data states: "Chiricahua Mts., Ariz. 9-9800 ft. July 28, 1927 J. A. Kusche, coll." This distribution is so disjoint with the known habitat of this species that it must be held a labelling error unless additional captures from Arizona can be made. Yet it should be noted that *E. macdunnoughi* does have just such a range, being found on the California coast and also through the mountains of Nevada down into Arizona.

REMARKS: This extremely well marked species can hardly be confused with any other. The general reddish or rich brown color is in sharp contrast to the majority of the *Eupithecia*'s, most of which are gray or blackish. Although the genitalia in both sexes show some similarity to those of *E. palpata*, the joining of the AM and PM lines is a character unique in the *palpata* (long palpi) group, and thus *karenae* should readily be identified. It seems amazing that so well-marked a species should have escaped description for all this time. It is a pleasure to name this species for my daughter, Karen, who accompanied us on the trip on which the first specimens were found.

BIBLIOGRAPHY

- McDUNNOUGH, J. D., 1949. "Revision of the North American Species of the Genus *Eupithecia* (Lepidoptera Geometridae)" Bulletin American Museum Natural History, Vol. 93, Article 8. New York.